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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2617351/PHH	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. **PCT/AU03/00235**	International Filing Date *(day/month/year)* 26 February 2003	Priority Date *(day/month/year)* 26 February 2002

International Patent Classification (IPC) or national classification and IPC

Int. Cl.[7] H01M 2/14, 2/16, 2/18, 8/02, 8/24

Applicant

CERAMIC FUEL CELLS LIMITED et al

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   [X] This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 1 sheet(s).

3. This report contains indications relating to the following items:

   - I [X] Basis of the report
   - II [ ] Priority
   - III [ ] Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV [ ] Lack of unity of invention
   - V [X] Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI [ ] Certain documents cited
   - VII [ ] Certain defects in the international application
   - VIII [ ] Certain observations on the international application

Date of submission of the demand	Date of completion of the report
10 September 2003	17 September 2003
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer **DAVID K. BELL** Telephone No. (02) 6283 2309

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/AU03/00235

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed.

☒ the description, pages **1 to 29,** as originally filed,
pages , filed with the demand,
pages , received on with the letter of

☒ the claims, pages **30, 32 to 35,** as originally filed,
pages **31,** as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages , received on with the letter of

☒ the drawings, pages **1/6 to 6/6,** as originally filed,
pages , filed with the demand,
pages , received on with the letter of

☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages

☐ the claims, Nos.

☐ the drawings, sheets/fig.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report*

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	**1 to 45**	**YES**
	Claims		**NO**
Inventive step (IS)	Claims	**1 to 45**	**YES**
	Claims		**NO**
Industrial applicability (IA)	Claims	**1 to 45**	**YES**
	Claims		**NO**

2. Citations and explanations (Rule 70.7)

D1 = US 6051220
D2 = US 6040076
D3 = US 20020048701
D4 = WO 0040520

The invention as defined in the present claims is a fuel cell gas separator consisting of a first layer made of a gas impermeable material, a second layer made of a gas impermeable material, the first and second layers having perforations which are closed by electrically conductive plug material, and a third intermediate layer between the first and second layers consisting of electrically conductive material in electrical contact with the plug material,

None of the cited documents either singly or obvious combination, disclose or fairly suggest the invention as defined in the present claims. The claimed invention is therefore novel and involves an inventive step. The claimed invention is industrially applicable.

9. A gas separator according to any one of claims 1 to 8 wherein the material of the third intermediate layer is the same as the electrically conductive plug material.

10. A gas separator according to any one of claims 1 to 9 wherein the perforations extend perpendicularly through the thickness of the first and second layers.

11. A gas separator according to any one of claims 1 to 10 wherein the perforations in the first layer are offset relative to the perforations in the second layer.

12. A gas separator according to any one of claims 1 to 11 wherein each perforation has an average cross-sectional dimension in the range of 50 to 1000μm.

13. A gas separator according to any one of claims 1 to 12 wherein the total area of the perforations through each of the first and second layers is in the range of 0.1 to 20 mm^2 per 1000 mm^2 surface area of an electrode-contacting zone of said layer.

14. A gas separator according to any one of claims 1 to 13 wherein the electrically conductive plug material is selected from cobaltite, Ag, Au, Pt, Ni, alloys containing one or more of said metals, and other silver-based materials.

15. A gas separator according to claim 14 wherein the electrically conductive plug material is selected from metallic silver, a metallic mixture in which Ag is the major component, a silver alloy and a silver-glass composite.

16. A gas separator according to claim 15 wherein the electrically conductive plug material is silver alloyed or mixed with any one or more of gold, palladium, platinum and stainless steel.

17. A gas separator according to claim 15 wherein the electrically conductive plug material is a silver-glass composite containing from about 10 to about 40 wt% glass.